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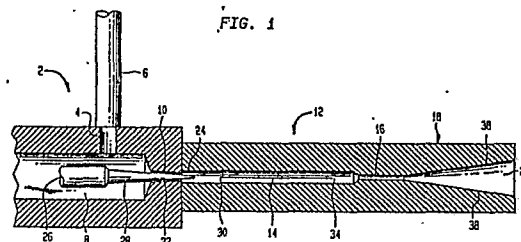
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54 **Apparatus and method for removing minute particles from a substrate.**

57 Apparatus for removing small particles from a substrate comprises a source of fluid carbon dioxide, a first orifice (10) for expanding a portion of the fluid carbon dioxide and find droplets of liquid carbon dioxide, a coalescing chamber (14) for converting the first mixture into a second mixture containing gaseous carbon dioxide and larger liquid droplets of carbon dioxide, a second expansion orifice (16) for converting said second mixture into a third mixture containing solid particles of carbon dioxide and gaseous carbon dioxide, and a divergent channel 20 having an exit port arranged to direct mixture toward the substrate. In using the apparatus, a source of fluid carbon dioxide having an enthalpy below about 135 BTU per pound (based on an enthalpy of zero at 150 psia for a saturated liquid) is employed.





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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Y,D	COMPRESSED AIR MAGAZINE, August 1986, pages 22-25, Phillipsburg, US; S.A. HOENIG: "Cleaning surfaces with dry ice" ---	1,2,4-8 ,10-12	H 01 L 21/00 B 08 B 3/02 B 24 C 1/00 C 01 B 31/22
Y	CH-A- 134 733 (MIDDEN-EUROPEESCHE OCTROOIMAATSCHAPPIJ) * Whole document *	1,2,4-8 ,10-12	
A	CH-A- 141 393 (ESCHER, WYSS & CIE. AG) * Whole document *	1,2,4-6 ,10-12	
A,D	US-A-2 699 403 (COURTS) ---		
A,D	US-A-3 074 822 (WALK) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 24 C C 01 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11-07-1989	Examiner VOLLERING J.P.G.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			